CONFERENCE REPORT | MARCH 1, 2017

Pennsylvania in the Balance

Harnessing Agriculture's Culture of Stewardship as a Solution to Clean Water

PennState College of Agricultural Sciences

PENN STATE AGRICULTURE AND ENVIRONMENT CENTER

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EXECUTIVE SUMMARY

On March 1-3, 2016, the College of Agricultural Sciences together with other partners hosted the *Pennsylvania in the Balance Conference* in Hershey, Pennsylvania. Over 120 diverse stakeholders attended the event, which provided a collaborative forum where motivated leaders in agriculture and the environment identified new, innovative solutions that can help ensure vibrant, productive agriculture while meeting water quality goals for Pennsylvania's rivers and streams and the Chesapeake Bay.

At the end of three days, clear themes and initial recommendations emerged which, if seized upon, can form the basis of a new consensus based, collaborative strategy to ensure profitable and productive agriculture while achieving water quality goals. **This strategy embraces agriculture and its ingrained *culture of stewardship*, and looks for leadership from agriculture to *be a solution* to clean water.**

Themes identified at *Pennsylvania in the Balance* include:

Embrace a Culture of Stewardship

Agriculture has high standards for conservation, with roots in a multigenerational culture of stewardship. Farmers desire to be the solution for clean water, and do not condone poor managers who are causing water quality problems. Programs to recognize and reward farmers meeting high conservation standards have strong appeal and may help raise the conservation bar.

Develop and Deploy Effective Targeting

Targeting limited resources to areas of high priority is essential. Effective targeting includes elements of all "3 Ps"—place, practices, and people. Place-based targeting should use the best available science and mapping along with local knowledge. There should also be a focus on key demographics (small dairy, Plain Sect, part-time famers, equine, and vegetable growers) and key practices (no till, cover crops, forest riparian buffers, and manure management.)

Integrate Soil Health, Manure Management, and Riparian Ecosystem Stewardship into Water Quality Strategies

The health of the land and water is critical to meeting both farm production and conservation needs. Approaches based on performance through land and water stewardship should be emphasized over practice based approaches. Soil health, management of manure as a resource, and stewardship of riparian ecosystems need to be priority messages. Clean and abundant water starts with soil health and function. Plans required by law must be meaningful management tools that are simple to develop and follow. Programs for forest riparian buffers must be highly incentivized, streamlined and flexible.

Support Community Based Approaches

Local and regional community based approaches work: most if not all Pennsylvania success stories to date are locally led. There is a critical need to foster more community based approaches that are farmer led, involving producers who are “thought leaders” in the community, and which build farmer-to-farmer support networks.

Recognize and Support a Three Pronged Approach

A three pronged approach is needed to accelerate adoption of conservation practices within the agricultural community: education and outreach; technical assistance; and enforcement. All three are important and complimentary, and the approach will work best if clear roles are defined and maintained, based on respective expertise and existing relationships. Challenges in meeting technical assistance demands must be overcome. Opportunities to enhance conservation training and build it into educational curriculum should be pursued. Support exists for selective, meaningful enforcement that targets bad actors with threats that are real and carried through to ensure all producers are managing operations consistent with protection of local waters.

Revisit and Retool Conservation Incentive Programs

Several existing programs work well and should continue to serve as the core of con -servation incentive programs. However, a willingness exists to revisit existing programs —such as forest buffer programs—to improve delivery, and explore innovative new incentive structures. Support exists to develop more strategic policies to offer—and withhold—incentives to influence action by those not in compliance.

Collaboratively Seek New Funding Opportunities

While being more strategic in spending existing resources is critical, existing funding is insufficient. New funding opportunities were identified and should be pursued. There was strong support for the formation of a diverse and inclusive coalition to develop and campaign for a collaborative new water quality funding strategy.

Since the conference, the Penn State Agriculture and Environment Center (AEC) has taken the lead in advancing conference ideas into action. The conference planning committee was reconvened in April 2016 to develop an action plan and framework for moving forward recommendations. In April and May 2016, key state and federal agencies were debriefed in a series of meetings, at which conference outcomes were presented and ideas for priority initiatives were discussed. Further feedback was solicited at several listening sessions held in August 2016 at Ag Progress Days.

A one day workshop, *PA in the Balance: The Reconvening*, was held on October 12, 2016. Approximately 100 participants, including original conference attendees and new stakeholders, participated in two working sessions where priority initiatives and key action steps were identified.

The resulting recommendations from conference and post-conference discussions include the development of an implementation framework consisting of an informal, collaborative partnership facilitated by the AEC. The **PA in Balance Partnership Council** which includes key agricultural and conservation stakeholders, including producer representation, is proposed to serve as the steering committee for this partnership moving forward.

Four initiatives, representing items which attendees and stakeholders agreed were priorities for action, are proposed. Each of these initiatives will be led by individuals and organizations in Pennsylvania with expertise and commitment to advance plans to action. These initiatives are:

1. **Increase Technical Capacity through Enhancements in Conservation Training Opportunities**
2. **Develop & Disseminate a Narrative Around a "Culture of Stewardship" through Soil and Stream Health**
3. **Develop New and Creative Incentives to Encourage a High Bar of Conservation Beyond Compliance**
4. **Develop and Deploy Delivery Mechanisms for Accelerating Conservation in Priority Watersheds**

Initiative 1. Increase Technical Capacity through Enhancements in Conservation Training Opportunities. These enhancements will complement existing USDA Natural Resources Conservation Service (NRCS) and state training programs to build the technical network of conservation professionals necessary to meet increased farmer demand for developing plans and implementing their associated conservation practices. Partners will explore development of training offerings to fill identified gaps and streamline training for interested professionals, as well as students within existing course offerings and degree and/or certificate programs. Farmer-to-farmer approaches and community, technical and vo-ag schooling opportunities will also be pursued.

Initiative 2. Develop and Disseminate a Narrative Around a "Culture of Stewardship" through Soil and Stream Health. The exciting new consensus based, collaborative strategy that has emerged from the conference embraces agriculture and its ingrained *culture of stewardship*, which constitutes the overarching theme infusing the entire partnership's work moving forward. We are looking to agriculture for leadership and to be the solution for clean water. By promoting this new narrative of stewardship, we will move all farmers from looking at conservation as something they *have to* do to something they *want to* do. This narrative will be developed through a strategic communications plan and communicated using traditional and modern, multimedia communication tools and approaches.

The hallmark of this narrative will be a farmer led effort to promote soil and stream health on the farm. This statewide education and outreach initiative will seek to involve producers, conservation technicians, Extension educators, nonprofits, and the ag industry. It will build off of successful farmer-led efforts and agency initiatives which promote water quality-based conservation practices in the broader context of maintaining soil health

and economic profitability. A holistic approach to on-farm conservation will be taken, integrating soil health with manure management and riparian ecosystem stewardship. This initiative will work with farmers to comply with state regulatory requirements in a way that is good for long-term profitability of the farm, water quality, and stream health.

Initiative 3. Develop New and Creative Incentives to Encourage a High Bar of Conservation Beyond Compliance. An agricultural certification program will recognize and reward producers who have reached a high bar of conservation. Recognition based, certainty based and market based incentives will all be explored to encourage producers to pursue certification.

Recognition based incentives acknowledge that farmers appreciate being recognized and rewarded for reaching high conservation standards within the industry. Recognition can also motivate peers to raise their conservation bar.

Acknowledging the need for the bar to be well above existing regulatory requirements and that those existing requirements cannot be relaxed, the linking of certification to a Pennsylvania ag certainty program will also be explored. This program will incentivize farmers to voluntarily accelerate implementation of practices that help meet local and Bay water quality goals.

Potential exists also for the certification program to be linked to product branding and "clean water" supply chains to meet corporate sustainability goals. The agricultural and food industry will be engaged to discuss consideration of these certifications in food supply chain management, marketing products, and corporate sustainability practices, providing market drivers for conservation practices on farms.

Initiative 4. Develop and Deploy Delivery Mechanisms for Accelerating Conservation in Priority Watersheds. Conference attendees emphasized the importance of focusing efforts in priority watersheds, where nutrient loads are high, local impairments exist, and local efforts are underway and can be built upon. To succeed in this prioritization effort, delivery mechanisms need to be developed and supported, including technical assistance in developing watershed plans which identify the right practices to be implemented in the right places, investment in partnership development and partnership management infrastructure, and the cultivation of and support for local leadership through watershed leadership training.

Pennsylvania success stories are almost always locally led. This initiative seeks to transform local success stories from the pilot nature it is now to the standard operating procedure for achieving water quality goals in the Commonwealth so that a network of local watershed leaders exists to sustain long-lasting partnerships in priority watersheds.

This initiative embraces the three-pronged approach to accelerating conservation implementation by creating local partnerships that first deploy the necessary education, outreach, and technical assistance to implement practices, and only turn to enforcement where non-compliers are given the opportunity but do not respond to these local partnership strategies. It enhances and accelerates the implementation of conservation where it is needed the most, and deploys a smart strategy of delivering a variety of leveraged program dollars to implement priority practices in an efficient, cost effective manner.

BACKGROUND

On March 1-3, 2016, the College of Agricultural Sciences together with other partners hosted the *Pennsylvania in the Balance Conference* in Hershey, Pennsylvania. This conference provided a collaborative forum where motivated leaders in agriculture and the environment identified new, innovative solutions that can help ensure vibrant, productive agriculture while meeting water quality goals for the Commonwealth's rivers and streams and the Chesapeake Bay. The conference acknowledged and commended progress and successes to date, but recognized that much more needs to be done and new and innovative approaches need to be developed and implemented.

Almost 120 diverse stakeholders attended, including farmers, agricultural industry representatives, scientists, federal and state agencies, researchers and Extension personnel, agricultural and environmental attorneys, nonprofit conservation organizations, conservation districts, planners, and agricultural consultants.

The conference framework included initial plenary sessions on day one, where experts shared relevant background information and scientific studies related to Pennsylvania and the Chesapeake Bay. A producer panel representing a wide diversity of Pennsylvania agriculture shared their perspectives to begin the second day. Over days two and three, attendees participated in facilitated small group work sessions on key topics, including targeting resources, technical assistance, innovations in incentives, compliance, and new funding strategies. Each small group represented a cross section of the stakeholders involved in these issues. The format allowed leaders from diverse perspectives to work together to identify barriers, opportunities and solutions, ask and answer hard questions, facilitate productive dialogue, build trust, and identify pathways forward to implement actionable outcomes.

At the end of three days, clear themes emerged which, if seized upon, can form the basis of a new consensus based, collaboratively focused strategy to ensure profitable and productive agriculture while achieving water quality goals. **This strategy embraces agriculture and its ingrained *culture of stewardship*, and looks for leadership from agriculture to *be the solution* to clean water.**

Initial recommendations and action items were identified at the close of the conference. These are being advanced collectively under the leadership of the Penn State Agriculture and Environment Center (AEC). Discussions at the conference and in a series of post-conference meetings and briefings, including a full day workshop at which conference attendees were reconvened, resulted in the identification of four priority initiatives to move forward.

The collective momentum and effort stemming from the conference has the potential to complement and enhance the Commonwealth's efforts to improve local water quality while also restoring the Chesapeake Bay, including development of Pennsylvania's Phase 3 Watershed Implementation Plan (WIP) for meeting the Chesapeake Bay Total Maximum

Daily Load (TMDL). The conference created a renewed energy among participants and a commitment to take collective action moving forward to resolve this complex and challenging problem.

Before discussing the conference and its outcomes in depth, relevant background on agriculture and water quality in Pennsylvania is provided.

Pennsylvania's Heritage: Agriculture and Water

Agriculture is a vital and prominent part of Pennsylvania's heritage. The Commonwealth's coat of arms, manifested on the state flag, includes multiple symbols invoking its rich agricultural resources and heritage—a plough; two horses; three shafts of wheat. Prime farmland soils and abundant rainfall make much of Pennsylvania highly suitable for agriculture. Proximity to major markets on the eastern seaboard accommodates commodity production of many marketable products.

Today agriculture remains a dominant part of the Pennsylvania landscape and economy. Pennsylvania is home to 57,900 farms producing a diversity of food, fiber and energy products. (NASS 2015). Pennsylvania farmers rank in the top ten in the nation for production of milk, poultry and eggs, fruit, nursery and greenhouse plants, and Christmas trees. (NASS 2015).

Pennsylvania is also blessed with water. An estimated 86,000 miles of rivers and streams flow through the Commonwealth. (DEP Draft Report 2016). These natural resources provide drinking water, water for use in agriculture and industry, habitat for aquatic species including the Eastern brook trout, and opportunities for recreational enjoyment.

While agriculture plays an important role in the Commonwealth's economy, cultural heritage, unique quality of life and stewardship of its abundant natural resources, it also contributes to water quality impacts. Over 20,000 miles of streams are impaired in Pennsylvania. (DEP Draft Report 2016). The top cause of impairment is nutrient and sediment runoff from agriculture, resulting in over 6,400 miles of impaired waters. (DEP Draft Report 2016).

These are not easy problems to fix. Impacts to water quality from excess nutrients and sediment are among the most complex and pervasive environmental problems faced today, not only in the Commonwealth of Pennsylvania but across the nation and the globe. In the United States, while the federal Clean Water Act has largely succeeded in addressing point source pollution, nonpoint source pollution from agricultural and urban lands remains a major, unsolved problem.

Pennsylvania is faced with particularly challenging issues as approximately 33,600 of its active farms are located in the Chesapeake Bay watershed, where federal cleanup requirements and initiatives are placing demands upon the Commonwealth to meet the nutrient and sediment reduction requirements from agriculture and other sources. Any solution must balance the Commonwealth's interests in a vibrant agricultural sector, local water quality, and limited state and federal resources.

Ag in Balance

In 2008, the College of Agricultural Sciences, in collaboration with the Pennsylvania Department of Agriculture (PDA), the Pennsylvania agricultural industry, Chesapeake Bay Foundation, and numerous other non-governmental organizations, sponsored the highly successful *Agriculture in Balance Conference* to explore these issues. In preparation for that conference a vision team was assembled consisting of leaders in Pennsylvania agriculture and the environment.

The team worked together in facilitated workshops to create a vision of what *Agriculture in Balance* means for Pennsylvania. Secretary Russell Redding, who was then Governor Rendell's Secretary of Agriculture and serves again in that role for Governor Wolf, coined the term *Agriculture in Balance*. The vision continues to have resonance today:

Agriculture in Balance is profitable, productive, progressive, and proactive, preserving its rich heritage of community involvement and environmental stewardship to build a better Pennsylvania. It provides an abundant and diverse supply of safe food, fiber, fodder, and renewable fuel where farmsteads, towns, and cities are nestled within a healthy mosaic of fields, forests, pastures, woodlands, and flowing waters. Agriculture in Balance is engaged in every level of society from the local community to the nation's capital, providing equitable opportunities for livelihood and enrichment.

The team also developed a white paper to unpack the vision statement so interested individuals and organizations can better understand what Pennsylvania's vision for *Ag in Balance* means. (Appendix B).

During a three day working conference in June 2008, the vision statement and white paper, along with an accompanying video produced by Penn State Public Media, was used to stimulate thought and discussion of ideas on how to reach Ag in Balance. Among the ideas shared were improving training and communication of the science and current research underpinning conservation practices, facilitating partnerships that work collaboratively to improve water quality on working landscapes, and build success stories in local, ag-impaired watersheds.

Many of the successes discussed below as "Pennsylvania's Progress" stem from the ideas, energy and momentum achieved at the *Ag in Balance* conference in 2008. This conference also served as the foundation on which the 2016 *Pennsylvania in the Balance* collaboration was built.

The Chesapeake Bay TMDL

Another prominent event impacting agriculture and water quality in Pennsylvania happened two years after the 2008 *Ag in Balance* conference. In December 2010, as required by the federal Clean Water Act, the U.S. Environmental Protection Agency (EPA) finalized the Chesapeake Bay Total Maximum Daily Load (TMDL).

The TMDL establishes allowable loads for nitrogen, phosphorus and sediment sufficient to meet water quality standards for the Chesapeake Bay, and the necessary load reductions that must be made to achieve water quality goals. It requires states within the Bay water-

shed to develop and implement watershed implementation plans (WIPs) to meet their responsible load reductions from all sectors, including agriculture. States establish two year milestones in meeting their reduction obligations, with 60% implementation required by 2017 and 100% implementation required by 2025. EPA reviews and evaluates state progress toward meeting their milestones and goals, and can employ federal "backstops" if states are not making sufficient progress in meeting obligations. (EPA 2010).

For Pennsylvania agriculture, the TMDL has meant a greater focus on reducing nutrient and sediment losses from agriculture. It has resulted in clearly delineated load reduction obligations for the ag sector. The obligations are significant. According to Pennsylvania's WIP, by 2025 farms in the Bay watershed in Pennsylvania must reduce loads of nitrogen by 25.8 million lbs/yr, phosphorus by 745,000 lbs/yr, and sediment by 263,500 tons/yr. (DEP 2011).

To meet these load reduction obligations, Pennsylvania's WIP calls for a variety of measures to be taken, including ensuring farms achieve baseline compliance with state environmental laws that pertain to agriculture. These include ensuring that farms have and are implementing an agricultural erosion and sediment control (Ag E&S) plan and, if applicable, a manure management plan or nutrient management plan. (DEP 2011).

The WIP also calls for significant implementation of agricultural conservation practices across Pennsylvania's portion of the Bay watershed by the year 2025. Among other practices, implementation goals include 1.6 million acres in enhanced nutrient management, over 400,000 acres in cover crops, 111,000 acres in forest riparian buffers, 260,000 acres in land retirement, and installation of animal waste management systems to handle waste from over 645,000 animal units. (DEP 2011).

Pennsylvania's Progress

Agriculture has accomplished much since *Ag in Balance* was held in 2008. Progress is being made, too, toward meeting Chesapeake Bay TMDL goals. A number of priority conservation practices have been implemented and reported to EPA since the TMDL was finalized. As of 2014, these include over 72,000 acres of conservation tillage, 110,000 acres of pasture management, over 15,300 acres of forest riparian buffers, 184,000 acres of cropland with conservation plans, installation of animal waste management systems to handle waste from 144,000 animal units, and 1,300 acres treated with barnyard runoff controls. (DEP 2015).

Among recent success stories is the Conewago Creek Conservation Collaborative Initiative. While there is a long history of conservation work in the Conewago Creek watershed—a 53.2 square mile watershed in Dauphin, Lancaster and Lebanon Counties—since 2009, the Conewago Creek Initiative, a partnership of over thirty organizations, has been working cooperatively to increase watershed engagement and work with farmers and landowners to adopt land management practices to improve water quality. The partnership is facilitated by the AEC and was supported from 2009 to 2013 by a Chesapeake Bay Stewardship Fund grant from the National Fish and Wildlife Foundation. Further support was provided by USDA's designation of the Conewago as a "Showcase Watershed" in 2010 and Pennsylvania Department of Environmental Protection (DEP) funding through the Section 319 nonpoint source pollution control program.

The Conewago Initiative's work resulted in increased citizen engagement and outreach, greater adoption of agricultural conservation practices, and positive water quality improvement trends. From 2009-2013, over forty outreach events engaging over 1,300 participants were held in the watershed. Adoption rates increased for many priority practices, some dramatically so. Total practices implemented during this time span include over 7,600 acres of those practices reported in acres (including cover crops, conservation tillage, and forest riparian buffers); 20 miles of those practices reported in linear feet (fencing, terraces, stream bank restoration, etc.); and 60 other practices (such as stream crossings, waste storage facilities, off stream watering, etc.).

In York County, improvements to an agriculturally impaired watershed resulted in water quality benefits so significant that DEP removed a stream segment from the impaired waters list. Pierceville Run, a tributary to Codorus Creek, was listed as impaired due to sediment runoff from agriculture in 2002. In 2006, a variety of partners, including the Izaak Walton League of America, DEP, York County Conservation District, and Aquatic Resource Restoration Company, implemented a stream restoration project in lower Pierceville Run. Forest riparian buffers and stream bank fencing were also installed under the USDA Conservation Reserve Enhancement Program (CREP).

Following restoration, DEP monitored the project area for pebble counts. Trends showed larger gravel and cobbles increasing overtime as fine sediments decreased. Aquatic habitat and macroinvertebrates were assessed in 2011. Biological integrity scores were indicative of a healthy, unimpaired stream, allowing DEP to delist a 1.6 mile stream segment in 2012.

Another successful trend is increasing adoption of no-till and cover crops throughout the Commonwealth. Contributing to these positive trends are grassroots, farmer-led efforts, prioritization of Extension based outreach and education, and innovative incentive programs.

The Pennsylvania No-Till Alliance was formed in 2005 by a group of like-minded producers who have used no-till in their operations and know the many benefits it has to offer. Over the last decade, the Alliance has worked to promote the successful application of no-till through shared ideas, experiences, education and new technology. As producers implement and improve upon their systems, the benefits of cover crops to soil health and the environment became increasingly clear. Through the work of the Alliance and its peer-to-peer educational approach, many producers in the Chesapeake Bay watershed have converted to no-till and begun to plant cover crops over the last decade.

Penn State Extension has also prioritized no-till and cover crops in recent years. Much of Penn State's current research, extension and outreach in agronomy is exploring and disseminating the multiple benefits of these practices and finding ways to get more conservation on the ground. Through a NRCS Conservation Innovation Grant, Penn State Extension implemented a robust education and outreach program to promote cover crops. From 2009-2013, Extension staff worked with others to implement 10 field scale demonstration sites, over 50 field walks and nearly 30 workshops, and produce numerous videos and news articles. These efforts reached thousands of farmers throughout Pennsylvania. During this same time period, cover crops increased in Pennsylvania by 360,000 acres based on remote sensing analysis.

Among the more innovative incentive programs in the Commonwealth is the Resource Enhancement and Protection (REAP) program. REAP is a tax credit program administered by the State Conservation Commission that allows producers to earn state tax credits for agricultural improvements to water quality. REAP was signed into law in 2007. Since that time it has made it more affordable for farmers to transition to no till. To date nearly 1,500 no-till planters and drills have been purchased statewide using REAP.

Federal contributions to the Chesapeake Bay watershed have been significant during this timeframe, and have put a significant amount of conservation on the ground in Pennsylvania. Since the 2008 Farm Bill, which ushered in the Chesapeake Bay Watershed Initiative (CBWI), the USDA Natural Resources Conservation Service (NRCS) has allocated over $190 million to Pennsylvania farmers to install conservation practices to improve water quality in the Bay watershed. (NRCS 2016). These include nearly 400 comprehensive nutrient management plans, over 750 animal waste storage facilities, over 41,000 acres of cover crops and another 40,000 acres of conservation tillage, and over 575 feet of fencing. (NRCS 2016).

Additional federal contributions come from USDA's Conservation Reserve Program (CRP) and Conservation Reserve Enhancement Program (CREP), which are administered by the Farm Survey Agency (FSA) and are the primary program and funding source for implementing forest riparian buffers. Since 1998, 24,000 acres of forest riparian buffers have been established in Pennsylvania through CREP.

NRCS is also a leader in training Pennsylvania's conservation professionals and providing valuable education to farmers on land and water stewardship, through programs like its "Unlock the Secrets of the Soil" soil health initiative.

Pennsylvania's progress has manifested itself in good news in our rivers and streams. The US Geological Survey (USGS) conducts water quality monitoring of rivers and streams in the Chesapeake Bay watershed under the Chesapeake Bay Nontidal Network. In 2015, USGS analyzed the nutrient and sediment load trends of 17 stations in Pennsylvania for which data existing over this time period. For nitrogen, 14 of 17 stations showed decreasing load (improving) trends. Similar trends were observed for phosphorus (13 of 17 improving; 1 with no trend), with steadier trends for sediment (8 of 16 improving; 5 no trend). (USGS 2015).

Despite this progress, Pennsylvania remains significantly behind on its Chesapeake Bay milestones. In June 2015, EPA released its interim evaluation of Pennsylvania's 2014–2015 milestones and WIP progress. While acknowledging that Pennsylvania did increase BMP implementation and was on track to meet 2017 targets for phosphorus, it was not on track for nitrogen or sediment. (EPA 2015). For nitrogen in particular, EPA found Pennsylvania to be "substantially off track," needing to reduce loads from agriculture by 14.6 million pounds to meet the 2017 interim goal of 60%. (EPA 2015). According to EPA, priority conservation practices on which Pennsylvania lags significantly include enhanced nutrient management, forest riparian buffers and grass buffers. (EPA 2015). A similar assessment was released by EPA in June 2016.

Because of this assessment, EPA kept Pennsylvania at "backstop actions level" in its TMDL review and assessment, a heightened level of scrutiny to which EPA moved Pennsylvania in 2014. This heightened level of scrutiny means that EPA may institute

federal backstops if programs, policies or initiatives are not developed to accelerate Pennsylvania's efforts. Indeed, in 2015, EPA took action to withhold approximately $3 million in federal funding to Pennsylvania until it produced a strategy demonstrating how it would get back on pace to meet its goals. Further EPA backstop measures could include expansion of permitting, permit application objections, redirection or conditioning of federal grants, increased EPA enforcement, or other possible measures.

A New Strategy

In January 2016, Pennsylvania unveiled a new strategy to enhance its Chesapeake Bay restoration effort, leading EPA to restore the $3 million in funding. Announced by the secretaries of DEP, PDA, and the Department of Conservation and Natural Resources (DCNR), the Chesapeake Bay Restoration Strategy has a Pennsylvania-centric goal of improving local water quality by reducing nutrient and sediment loads in Pennsylvania waterways. By focusing on local water quality improvements, restoration of the receiving downstream waterbody—the Chesapeake Bay—will be achieved. (DEP 2016).

The strategy seeks to focus and increase resources and technical assistance, reinvigorate partnerships, organize for success and create a culture of compliance. It has six elements:

1. Address pollutant reduction by inspecting 10% of farms and municipal separate storm sewer systems (MS4s) in the watershed annually, ensuring development and use of manure management and ag E&S plans; and instituting enforcement for non-compliance.

2. Quantify undocumented conservation practices in watersheds impaired by agriculture or stormwater, and put more high-impact, low-cost practices on the ground.

3. Improve reporting, record keeping, and data systems to provide better documentation and obtain maximum credit toward Bay goals.

4. Identify legislative, programmatic or regulatory changes to provide the additional tools and resources necessary to meet Bay goals by 2025.

5. Establish a DEP Chesapeake Bay Office to coordinate development, implementation and funding of Pennsylvania's Chesapeake Bay efforts.

6. Obtain additional resources for water quality improvement.

(DEP 2016).

To meet the annual farm inspection goals, DEP will work with cooperating county conservation districts, using existing funds to shift their Chesapeake Bay obligations from 100 educational farm visits to 50 farm inspections per full time person funded annually. In addition, DEP regional staff will also be conducting inspections. The goal is to complete up to 3300 inspections per year. These inspections will initially be focused on whether farmers have their required ag E&S plans and manure management plans. (DEP 2016).

Among the highest priority conservation practices on which the strategy focuses is forest riparian buffers. Based on progress to date, 95,000 acres of new forest riparian buffers must still be implemented in the Bay watershed by 2025 order to meet the goals set forth in Pennsylvania's WIP. DCNR will lead this renewed emphasis on riparian forest buffers, establishing a Riparian Buffer Advisory Committee to explore new innovations and strategies in order to accomplish this goal. (DEP 2016).

Various measures will be employed to quantify and report previously undocumented conservation practices implemented in Pennsylvania, including a farmer survey launched by Penn State in January 2016 and developed in collaboration with DEP, PDA, State Conservation Commission, Pennsylvania Association of Conservation Districts, Pennsylvania Farm Bureau, PennAg Industries, Professional Dairy Managers of Pennsylvania, Pennsylvania Association for Sustainable Agriculture, and the Pennsylvania Farmers Union. It asks farmers questions about conservation practices installed voluntarily and using their own money for which data is currently lacking. A pilot project with NRCS using aerial imagery to document conservation practices in the Potomac watershed was also conducted in 2016.

PENNSYLVANIA IN THE BALANCE

It has been over eight years since *Ag in Balance* set forth a vision for Pennsylvania agriculture. Much has been accomplished since then. Yet the lift remains heavy, and Pennsylvania is not on pace to meet interim goals set for agriculture related to Chesapeake Bay restoration. Given the ongoing challenges and looming deadlines, combined with the Commonwealth's renewed and increased support of Chesapeake Bay strategies, now is the time to work together to identify new approaches. The need is urgent, as there is much at stake for Pennsylvania.

On March 1-3, 2016, the College of Agricultural Sciences together with other partners hosted the *Pennsylvania in the Balance Conference* in Hershey, Pennsylvania. This conference provided a collaborative forum where motivated leaders in agriculture and the environment identified new, innovative solutions that can help ensure vibrant, productive agriculture while meeting water quality goals for the Commonwealth's rivers and streams and the Chesapeake Bay. A complete agenda is found in Appendix C.

A planning committee was established that included leaders at the College and the University and several critical partners, including the PDA, DEP, EPA, USDA NRCS, USDA Agricultural Research Service (ARS), Chesapeake Bay Foundation, Pennsylvania Farm Bureau, PennAg Industries, Pennsylvania Association of Conservation Districts, National Fish and Wildlife Foundation, and Stroud Water Research Center. In the months leading up to the conference, the committee worked collaboratively to identify the key issues for discussion and to develop a framework to bring together the foremost expertise to identify opportunities and solutions, facilitate productive dialogue, build trust between stakeholders, and achieve results in actionable outcomes.

While this conference was meant in some ways to be a revisit to the 2008 *Ag in Balance* conference, the urgency of where Pennsylvania currently stands with respect to its Chesapeake Bay commitments provided the driving force for the conference and a focus for the discussions. The progress and successes discussed above are to be acknowledged and commended, but it is clear from all perspectives involved that more needs to be done and new and innovative approaches need to be developed and tried.

The conference title—*Pennsylvania in the Balance*—was deliberately chosen as a slight twist on the inspiring vision developed eight years ago, with the hope that all involved would acknowledge what hangs in the balance and devote their time and energies to developing new actions and a renewed commitment to meeting the vision for Pennsylvania's agriculture and natural resources.

The conference was a huge success. Nearly 120 diverse stakeholders attended, including farmers, agricultural industry representatives, scientists, federal and state agencies, researchers and Extension personnel, agricultural and environmental attorneys, nonprofit conservation organizations, conservation districts, planners, and agricultural consultants. A complete list of participants is found in Appendix D.

Initial plenaries were held on day one, where experts shared relevant background information and scientific studies related to Pennsylvania and the Chesapeake Bay. Day one concluded with a panel of diverse stakeholders sharing their thoughts on the challenges in meeting water quality goals and sustaining a vibrant agriculture in Pennsylvania.

In a general sense, many of the challenges identified related to lack of resources and capacity. The issue of the small dairy sector and the expensive investments needed to solve their water quality problems was specifically raised, as were capacity issues in providing technical assistance and riparian buffer program delivery. Others raised concerns about the failure to invest in "scaling up" pilot approaches that have worked, and the lack of wise spending of resources in general. In the words of one stakeholder, "we've doled out way too much money without the strings attached."

Opportunities to meet challenges were shared as well. Attendees noted that voluntary conservation works when the time is given to build relationships between farmers and conservation professionals. These positive relationships allow conservation professionals to work with farmers and recommend conservation practices and systems that address identified natural resource concerns. Depending on the farm operation, some of these may increase a farmer's net income. Education and outreach, particularly on practices that are good for bottom lines, are effective and should receive higher priority.

One stakeholder observed that many policies and approaches to date have failed to recognize the human dimension. Farmers are individuals, making management decisions about their businesses which are tied to and dependent on the land and water resources they own and manage. In this respect it is not a scientific or a technical problem, but a policy problem. It is first and foremost about changing human behavior, a stakeholder noted, and the policies and approaches must be developed and deployed to achieve this.

To begin the second day, a producer panel representing a wide diversity of Pennsylvania agriculture shared their perspectives. Over days two and three, attendees participated in facilitated small group work sessions on key topics, including targeting resources, technical assistance, innovations in incentives, compliance, and new funding strategies. Each small group represented a cross section of the stakeholders involved in these issues. The format allowed leaders from diverse perspectives to work together to identify barriers, opportunities and solutions, ask and answer hard questions, facilitate productive dialogue, build trust, and identify pathways forward to implement actionable outcomes.

At the end of three days, clear themes emerged which, if seized upon, can form the basis of a new consensus-based, collaboratively-focused strategy to ensure profitable and productive agriculture while achieving water quality goals. **This strategy embraces agriculture and its ingrained *culture of stewardship*, and looks for leadership from agriculture to *be a solution* to clean water.**

A set of initial recommendations and action items were identified at the close of the conference. Since the conference, recommendations have been advanced collectively

under the leadership of the AEC. Post-conference planning committee discussions, debriefings with key agencies and stakeholders, and a reconvening of conference attendees and other stakeholders in October 2016 resulted in development of four priority initiatives and a framework for implementation.

This collective effort has the potential to complement and enhance efforts to improve local water quality while also restoring the Chesapeake Bay, including development of Pennsylvania's Phase 3 WIP. The conference created a renewed energy among participants and a commitment to take collective action moving forward to resolve this complex and challenging problem.

ISSUES

Six key issues were identified at *Pennsylvania in the Balance* as critical to solving our collective agriculture and water quality problems. A panel of producers was convened at the conference to share the importance of the producer perspective, while the other five issues provided the framework for conference work sessions.

The Importance of the Producer Perspective

To reach water quality goals, it is paramount that the producer plays an active role in developing and implementing strategies for improvement. This is particularly so when the companion goal is sustaining and promoting a thriving, vibrant agricultural industry in Pennsylvania.

As the conference producer panel made evident, many farmers are conservation leaders and they operate a wide diversity of farms—from Amish small dairies to poultry and hog confined animal feeding operations (CAFOs) to certified organic vegetable farms to 1,000 cow dairies cropping several thousand acres. But with this diversity, there are commonalities in their approach to conservation. Farmers who have embraced conservation see its benefits for land and water health and farm productivity and profitability. One farmer said that conservation is "*more than* compatible with our farm."

Producers pointed out that good agricultural practices benefit water quality by keeping vegetation on fields, increasing water infiltration, building soil health and keeping it on the farm. One panelist noted, "I saw old aerials of the farm during my grandfather's day, when the erosion was everywhere and we were losing topsoil. I never want to go back to that."

The producers attending the conference are leaders in conservation. They observed that many other farmers in Pennsylvania must be brought on board. Producers who are implementing conservation want to see that happen. As Secretary Redding noted, ultimately, through the leadership of Pennsylvania's agricultural community, the narrative will need to change from *I have to do it* to *I want to do it*. A common question asked at the conference was: how can the strong leadership and stewardship ethic of these producers be harnessed to achieve the shift in this narrative Commonwealth-wide?

Who, What and Where: Strategies for Targeting Resources

Given finite resources to meet Pennsylvania's agricultural goals for improving local and Bay water quality, it is important to ask: *to whom, what and where* should our resources be targeted? In recent years, there has been an increasing understanding of the importance of targeting, with development and utilization of priority watersheds for federal and state funding programs.

But how should this be done to achieve the greatest nutrient reductions? How should this be done to achieve both local water quality and Bay water quality goals?

One aspect of targeting focuses on the *where*. Where on the landscape should efforts be focused? Are there specific geographic areas or land uses that should be prioritized?

Other questions relate to the *what* and the *who*. What practices should resources be focused on delivering? Who from the agricultural community should we focus our efforts towards?

Effective targeting involves a well thought out strategy and analysis of best available information. How can an effective, targeted focus for funding and implementation be developed? What is the role of science and technology in targeting efforts? Does an adequate understanding of current baseline conservation exist to know where to focus next? How can we consider the producer perspective and landowner decisions when developing effective targeting strategies?

Achieving Regulatory Compliance

The stark reality is that too many Pennsylvania farmers are not in compliance with existing state laws and regulations regarding agriculture and the environment. Yet achieving baseline compliance is a cornerstone of Pennsylvania's WIP.

Many questions must be explored in order to achieve regulatory compliance for agriculture. What barriers exist for noncompliant farmers to be in compliance? What is needed to bring all farmers into compliance? What is the role of respective agencies and other stakeholders, including EPA, DEP, conservation districts, the agriculture industry, conservation organizations? What is the proper role of compliance related tools, such as farm inspections or enforcement actions?

Ensuring Adequate Technical Assistance Capacity

Farmers rely on conservation professionals to provide technical assistance (TA) to develop conservation and nutrient management plans and to design and implement conservation practices. Yet the work load is great and a "TA bottleneck" exists in Pennsylvania.

How can this bottleneck be overcome so all farmers needing technical assistance to develop plans and implement practices can get that assistance in a timely manner? To answer this question, strategies that work well, and where challenges exist, need to be identified. What are the respective roles of NRCS, conservation districts, private sector, and nonprofits in delivering TA? How do we build additional capacity to achieve planning and implementation technical assistance needs?

What are the best strategies for technical assistance providers to work collaboratively to increase capacity? What can be done to increase the amount of trained and qualified conservation professionals in the Commonwealth to meet demand? And finally, what are the roles for technology and self-help tools to meet planning objectives?

The Need for Innovation in Incentives for Implementation

Many programs exist to incentivize conservation on the ground. The myriad of programs can, in fact, be overwhelming and a barrier to adoption. Moreover, even with strong financial incentives, some high priority practices, such as forest riparian buffers, are not currently being adopted at the rates needed to meet our water quality goals for agriculture. Strategies must be identified to create an incentives structure that maximizes the acceleration of adoption given finite resources.

Some existing programs work well to incentivize conservation. What are the most successful and why? And for those which are less successful, what opportunities exist to improve existing programs to better achieve implementation goals?

Some mix of policy, programmatic, financial incentives and community based efforts are likely needed to accelerate adoption. What are the ingredients in this mix? Are there new or different programs to help incentivize conservation in Pennsylvania? What is the role of compliance enforcement as an incentive? What opportunities exist for cost effectively addressing agriculture and stormwater runoff in mixed land use settings?

Technology can play a key role in addressing water quality in agriculture. What opportunities exist for technology to achieve nutrient reduction, address manure imbalances, and increase efficiencies in achieving conservation goals? Where are opportunities for institutional change to drive adoption of new technologies, use of markets, or other systemic changes?

The Need for Additional Resources for Water Quality Improvement

A key limiting factor exists in our Chesapeake restoration efforts in Pennsylvania—money. To be frank, existing funding amounts are inadequate to meet local water quality and Chesapeake Bay goals. New sources of funding must be sought and a new water quality funding strategy developed.

To begin developing that strategy, current funding programs that are working well need to be identified. So do ones that can be improved upon, with suggestions on how to do so. But beyond existing programs, what new or innovative funding sources might be pursued? What are the roles and expectations for additional federal, state, and local funding opportunities moving forward?

As a new funding strategy is developed, how can existing funding sources be leveraged to find new funding? What opportunities exist for public/private partnerships?

THEMES

Conference attendees split into separate workgroups of 14-16 participants and wrestled with these issues in facilitated work sessions. After synthesizing over 100 pages of work session and general session notes from the conference, the following themes emerged:

Embrace a Culture of Stewardship

Agriculture has high standards for conservation, with roots in a multigenerational culture of stewardship. Farmers are ready to lead, and be a solution for clean water.

Farmers take very seriously land and water stewardship and practice it every day on their farms. The success of their farming operations—their business and livelihood—is dependent on healthy, productive soils and clean, abundant water. Many of these farmers are stewarding the same land that has been in their family for generations. This culture of stewardship is prevalent in the agricultural community, and should be embraced. Farmers are part of the solution to clean Pennsylvania rivers and streams, and a healthy Chesapeake Bay.

Farmers are leaders within their communities and the Commonwealth. These leaders helped shape the *Pennsylvania in the Balance Conference*. Approximately a dozen producers attended the conference. From the producer panel which kicked off day two, to creative and thoughtful dialogue in all six working session groups, Pennsylvania's farmers left their imprint on this conference.

Yet the producers who attended the conference are only a small sampling of leadership in Pennsylvania agriculture. Such leaders exist in rural communities across the Commonwealth. They are not uniform; as on participant noted, they "come in various shapes and forms." All participants from all stakeholder sectors—particularly those providing conservation services and technical assistance—recognized the importance of finding the local "thought leaders" in the agricultural community to steer successful water quality improvement initiatives. Another participant noted that in many rural communities, farmers play prominent roles in local government, often as local elected officials and trusted leaders.

Programs to cultivate and grow leadership and perspectives within the agricultural community were also suggested. One idea shared was a field trip to the Bay to see impacts, continuing up the watershed to meet with farmers and communities and see local impacts as well.

Many groups discussed the challenges of working with those farmers who are contributing to water quality problems. A common viewpoint shared at the conference by those practicing good stewardship was that they do not condone poor managers who are causing water quality problems. "I can't defend the mistakes of a fellow co-worker," said one participant.

While farms that contribute to water quality are often seen as high priorities for BMP funding and implementation, several participants shared that perhaps a paradigm shift is in order. “We spend program dollars to fund bad actors, and those who are doing a good job are not rewarded,” lamented one participant. “Rewarding bad behavior is counterproductive.” Some participants surmised that it might not be the wisest idea to “subsidize” small farms, as larger farms do a better job of reducing pollutants. “If you can’t afford to be a sustainable famer, maybe you shouldn’t be farming,” said one. In other lines of business, it was noted, there are market consequences for poor business owners. “Maybe if people can’t afford to implement management practices, then just like in other areas of business, those bad managers do not stay in business,” said one participant.

Yet other conference participants recognized important cultural, historical, and quality of life rationales for continuing to support the diversity of farming enterprises in Pennsylvania, especially small family farms. These are often the very farms that need outreach, administrative, technical and financial assistance to learn about and take advantage of programs. Perhaps, some conference participants surmised, not enough has been done to reach these farmers. The stark reality is that agricultural sources of water quality impacts are priorities that must be addressed in the immediate near term, and that takes money. In the case of some sectors, like small dairy, it will take a significant amount of money.

Many participants suggested capitalizing on the culture of stewardship by creating programs to recognize and reward farmers meeting high conservation standards. One existing program that incorporates this model is the USDA NRCS Conservation Stewardship Program (CSP). This program has become the most popular conservation program in the country and is available to farmers and operators in Pennsylvania.

With respect to new programs embracing a culture of stewardship, the common concept discussed at the conference was a statewide certification program with standards for conservation practices that go above and beyond baseline compliance. Such a program has strong appeal in the agricultural community and may help raise the conservation bar.

While recognition itself (including signage, prestige in meeting certification standards) may incentivize many producers to elevate the level of conservation on their farms, many participants felt that linking the program to some level of regulatory relief (i.e., “ag certainty”) would provide much greater incentive to participate. Existing programs in Virginia and Minnesota were shared in several of the work sessions as potential models.

As a Pennsylvania program is explored, it is important to note that the Commonwealth has existing statewide regulatory programs which may not exist in other jurisdictions which have adopted ag certainty. This means that the program must be carefully crafted to ensure the “high bar” of conservation is well above the minimum standard of regulatory compliance, and the regulatory relief granted is not a relaxation of existing requirements.

With these points in mind, one potential opportunity to provide ag certainty and thus incentivize participation in a certification program could insulate farmers from the inspections presently being conducted as part of DEP’s new water quality strategy. Certification programs could also be linked to market based demand for “clean water” products and suppliers, providing additional incentive for participation.

Develop and Deploy Effective Targeting

Targeting limited resources to areas of high priority is essential. Effective targeting includes elements of all "3 Ps" – place, practices, and people.

Conference participants were nearly universal in agreeing that targeting is essential to strategic use of limited resources and achieving maximum water quality benefit for resources spent. Effective targeting most certainly involves geography, but also all "3 Ps" – place, practices and people.

Place-based targeting should start with the best available science and mapping to identify priority watersheds. NRCS uses this approach. With respect to nutrients, NRCS utilizes data from USGS's SPARROW model to determine and map the local yields of total nitrogen and total phosphorus from watersheds at the 12-digit hydrologic unit (HUC-12). These combined with data on watersheds where brook trout are greatly reduced and Section 319 agricultural watersheds are used to create priority watersheds annually for delivery of its program dollars.

Conference participants further noted that advancements in technology have led to the development of new tools to aid watershed managers, and the ability to identify priorities on even smaller scales. These tools should be utilized to refine and prioritize local areas within a watershed for outreach, technical assistance and implementation efforts.

For example, soil data, high resolution aerial imagery and LiDAR can be used to determine "hot spots" or critical source areas prone to nutrient losses to streams. NRCS conservation planners utilize science-based information to identify specific areas with potential for high runoff and/or leaching, and incorporate LiDAR to identify potential gullies and highly erodible lands. This type of analysis allows for "precision conservation on a watershed scale," noted one participant. Another cautioned that this type of precision targeting only works if landowners are willing to make changes to current land management practices.

Participants also acknowledged the importance of local knowledge, which should be coupled with information developed through science and technology. County ag service centers generally house conservation districts, Extension and NRCS under one roof. Sitting down collaboratively with these local conservation professionals together with local watershed groups, farmers and private ag consultants would very quickly result in a good understanding on where to focus efforts. NRCS has utilized a local workgroup approach for decades to meet annually and identify priority areas in specific counties.

A need to focus on priority practices was also generally accepted in the work sessions, though many participants cautioned that a "one size fits all approach" does not work for ag conservation, given the unique nature and mix of the agricultural operation, the farm landscape, and the farmer. Qualified conservation planners are trained to work with individual farmers to help cut through the bewildering maze of conservation practice offerings by explaining the relevant conservation practices and their effects on the landscape and the farm operations.

While the need for this approach the continued availability of the full menu of conservation practices is acknowledged, the importance of focusing on priority practices allows producers, conservationists and policy makers alike to focus on practices that are

effective in reaching water quality goals. Among practices discussed for such a short list included no-till, cover crops, stream bank fencing, forest riparian buffers, nutrient management, barnyard improvements, and manure storage.

Workgroups devoted much discussion to the people aspect of targeting. A problem with conservation efforts to date is the "first come, first serve" nature of its delivery. This has resulted in implementing practices primarily on farms of those who "come through the door," the early adopters who willingly seek technical assistance and program dollars. "We need to target farmers who do not go to Penn State Extension, conservation districts, or NRCS," said one participant.

The Plain Sect was a community specifically discussed for prioritized efforts. Many partners, including NRCS, conservation districts, and nonprofit organizations like Lancaster Farmland Trust, Chesapeake Bay Foundation and Stroud Water Research Center, have made successful inroads, and have programs that can be built upon. It was noted by one participant that the Amish population is growing and most want to farm, so it is a particularly important sector. Many participants noted the unique nature of that community and the need for "a different approach" to conservation efforts. The importance of working with religious leaders in local Amish communities was raised. In addition, while many Amish will not accept financial assistance for practices, they may be open to technical assistance, and programs should be customized to these understandings.

A number of other groups were also mentioned as priority groups. Small dairy, a sector which often coincides with the Plain Sect, was one such group. Many of these farms need expensive infrastructure to address very real water quality issues but may lack the resources to pursue solutions. Vegetable farmers were identified by some groups for targeting because of extensive tillage associated with crop production. Part time or hobby farmers, as well as equine, were other groups recommended for targeting. Particularly where these operators are new to farming, the need for conservation education and assistance is often high.

Integrate Soil Health, Manure Management, and Riparian Ecosystem Stewardship into Water Quality Strategies

The health of the land and water is critical to meeting both farm production and conservation needs. Soil health, management of manure as a resource, and stewardship of riparian ecosystems need to be priority messages that are infused into the Commonwealth's water quality restoration strategies.

While funding and implementing conservation has often taken a practice based approach and education has emphasized specific practices, many participants suggested a different frame which emphasizes stewardship, or management, of land and water resources to achieve environmental performance compatible with agronomic production. With respect to conservation practices, not every practice is compatible with every farm. "The general principles of conservation—such as soil health—are more universal," noted

one participant. Many suggested that messaging to farmers should be crafted around these universal conservation principles. A focus on improving management for soil health may reduce the need for more expensive conservation practices to improve water quality, suggested participants.

The importance of soil health was a theme that resonated throughout the conference. It relates directly to clean water, several participants noted. “We are blessed with water in Pennsylvania,” said one. Clean and abundant water starts with soil health and function. Supporting soils as living organisms and natural mechanisms for water infiltration and purification is crucial to meeting both agricultural production and water quality goals.

These kinds of soil health messages should build upon successful high priority efforts already underway in Pennsylvania and beyond, such as the NRCS Soil Health Initiative, the Pennsylvania No-Till Alliance, county conservation district efforts, Extension programming and research from the Penn State College of Agricultural Sciences, and the Pennsylvania Association for Sustainable Agriculture’s new SOIL Institute. Devoting specific resources to soil health education and peer-to-peer farmer outreach was one suggestion as to how this initiative could grow. This would be money wisely spent, noted several participants, since once farmers understand the importance of soil as a living organism vital to meeting both production and water quality goals, they will change their management without the need for implementation of expensive structural practices.

Participants also recognized that Pennsylvania, particularly in the southcentral region, has a high intensity of livestock production. This presents challenges with handling excess manure and meeting manure management objectives. Participants recognized that for many Pennsylvania farmers, managing manure not as a waste product but as a resource to support crop production and soil health is also a critical message for farmers.

The topic of manure led to discussion on the various plans that farmers are required to have by law, including agricultural erosion and sediment control plans, manure management plans and nutrient management plans. Producers indicated that for these plans to be helpful, they must be meaningful management tools. They must be simple to develop and easy to follow if they stand a chance at actually being implemented and actively used to guide farm management. “We are required to give them a compliance document, but what we really want to give them is a management tool,” noted one participant.

The manure management plan, required by Pennsylvania law for farms that produce or utilize manure, was given as an example of a common sense, easy to follow plan that can be readily implemented and adapted into farm management and operations. Some participants cautioned however that the importance of creating simple, functional management tools can lead to challenges in getting such tools recognized by the Chesapeake Bay Program as sufficient in achieving nutrient and sediment reductions and therefore receiving “credit” in the Bay Model.

Stream health is also important, as noted by participants. Many, many farmers have significant stretches of streams flowing through their farms. While forest riparian buffers are a tougher sell with producers, they remain a highly valued, priority practice. “Near stream areas is where we need to be spending money,” commented one participant. “Farmers need to give streams space. Finding ways to get it done is the hardest sell we have.”

To make that sell, many participants posited that programs for forest riparian buffers should be highly incentivized, streamlined and flexible. The importance of farmers in practicing riparian ecosystem stewardship and providing multiple, ecosystem service benefits for the farm, the community and society should be emphasized. These benefits include flood control, pollinator and wildlife habitat, cooler stream temperatures, shade for fish and aquatic life, fishing and other water based recreation, and herd health.

These aspects of management go hand in hand, and an integrated approach to messaging, education and outreach, and implementation funding involving all three management aspects has strong appeal among all stakeholders. If all farmers managed their production land for soil health, managed their manure as a resource, and managed stream corridors for ecosystem health (seeing buffers as their "pet," in the words of one producer), we would be well on our way to achieving Pennsylvania agriculture in balance.

Support Community Based Approaches

Local and regional community based approaches work. There is a critical need to foster more community based approaches that are farmer-led.

Most if not all success stories to date in Pennsylvania involve locally led, community based approaches to water quality improvement. State, federal, private and foundation funders need to continue to make resources available to achieve success in locally led restoration initiatives. This includes providing the technical assistance and tools needed to conduct strategic watershed planning, provide decision support tools to help local leaders make better watershed management decisions, coordinate and conduct outreach to farmers, municipalities and other key landowners, develop conservation plans, and design and implement conservation practices.

Yet investment is not only needed in technical tools and expertise, but also in leadership training. Participants pointed out the importance of enhancing the capacity of local communities by building and sustaining local leadership and watershed based community engagement and partnerships. All communities have leaders capable of steering these efforts. Some need to be discovered and cultivated; others don't even yet know they are the leaders of tomorrow.

Several participants recognized that local, community based approaches must be organic and customized to the specific region, community and local leadership structure and dynamics. For example, while focus on a single watershed may work in a particular area (e.g., Conewago), others may be more suited for county based efforts (e.g., York County); still others on broader regional partnership structures to support local work (e.g., the Upper Susquehanna Coalition). Regardless of scope, local coalition approaches should be fostered, where multiple partners share expertise, leverage funding, and improve efficiencies to achieve greater conservation outcomes.

Particularly important are farmer-led initiatives. Several participants noted that building community based water quality initiatives in agricultural areas can be challenging. Some of the challenges lie in the nature of the farmer, noted one group. The farmer often

chooses that profession because he/she is “independent by nature and does not want help.” Farmer led efforts have a much greater chance at success. “Conservationists and ‘bad’ farmers never run in the same circles,” offered one participant. With respect to some communities, new and customized outreach strategies might have to be developed. It was noted for example that many Amish will not accept financial assistance for practices, but they will accept technical assistance. Thus programs focused on outreach, education and free technical assistance may be more productive.

Farmer-led initiatives are likely to succeed when they involve those producers who are “thought leaders” in the community, and when they build farmer-to-farmer networks. The Pennsylvania No-Till Alliance is a successful model for this peer-to-peer approach. These strategies work and are highly embraced by the agricultural community. Farmer-led efforts provide the trust which is necessary to reach other farmers, and can cost effectively provide education and technical assistance to other farmers.

However, to truly be successful, local community efforts must involve and embrace not only the farmer, but the full range of stakeholders in the community. In many agricultural communities, there is an intertwining of land uses and a very real interface of urban and rural; thus opportunities exist to collaboratively and comprehensively address both agricultural and urban runoff. Language that says “we are all in this together” is needed to build that community mindset.

One participant suggested that broadly stated, easily understood, publicly stated goals (e.g., percent of land under cover in winter; miles of streams protected by trees) can be useful to rally the whole community behind these goals and develop knowledge of and support for good conservation, not just by farmers, but local government and the general population. Collaboration with “outside” partners who can bring certain technical skills or expertise, particularly when the initiative remains locally led and locally driven, is often critical to success.

Recognize and Support a Three Pronged Approach to Accelerate Conservation

A three pronged approach is needed to accelerate adoption of conservation practices within the agricultural community: education and outreach; technical assistance; and enforcement.

Participants acknowledged that education and outreach, technical assistance, and enforcement are all important and complimentary and must be deployed to accelerate conservation implementation to the levels necessary to meet water quality goals.

Even in the age of digital communication and distance learning, many participants placed a high value on traditional, face-to-face learning opportunities which bring together agriculture and conservation educators and farmers. Farmers attend winter meetings, field days and workshops where they can learn from field experts and their peers. Resources should continue to be prioritized for these efforts.

Cooperative efforts among sectors of farmers in key regions were also suggested as ways of maximizing education and outreach efforts. Extension could serve as a catalyst for these efforts. A successful cooperative of Adams County fruit growers was cited as an example.

The importance of education was brought up by one participant in the context of where the needs really exist. “Some farms just need basic management training, not technical assistance. We need to distinguish between these two and deliver each where needed.”

Participants recognized that challenges in meeting technical assistance demands are real and must be overcome. Yet the extent of those challenges varies regionally. There are some portions of the Commonwealth where few farms lack conservation plans and planning assistance needs are generally met. Others have multi-year backlogs for district plan writing assistance. Given these regional differences, one idea shared was developing and deploying in locations of priority need conservation *tiger teams*: a group of technically skilled and experience planners who can work together synergistically to meet that need expeditiously. Perhaps, one participant suggested, these teams could be employed in circuit rider fashion to regions with the highest technical assistance demands.

A potential negative consequence of this approach was also raised, however. If technical assistance is targeted in the short term to areas where planning needs are great, will those newly written plans lead to implementation, particularly if they were written for farmers who have not previously shown a willingness to adopt conservation practices?

To this end, many participants pointed out that developing the requisite plans is only a precursor to conservation. Conservation does not get done and water quality improvements are not realized unless those plans are followed and practices are implemented. Technical assistance too does not stop with plan writing; farmers often need conservation professionals to help work with producers to identify, design and implement solutions to complex resource concerns.

To provide this level of support requires highly trained technicians. They need education and training in soil science, hydrology, botany, agroecological systems, and engineering. “They are landscape doctors,” said one participant. And you often need a landscape doctor to diagnose and treat a complex landscape problem.

Many participants also recognized that there is a place for farmer “self-help” tools where simpler technical assistance needs exist, such as developing manure management plans. Tools like PAOneStop and the Manure Management Manual are helpful resources. Incorporating farmer mentoring, retired professionals, agronomy students, and Future Farmers of America (FFA) into farmer outreach and training were suggested as ways of enhancing their use and helping to close the technical assistance gap. Since many of these tools are computer based, suggestions were made to bring tech-savvy youth into the technical assistance process. Because of the simplicity of the manure management planning process, workshops work well to accomplish plan writing with farmers, though some conservation districts have struggled to get farmers to attend.

It was noted that opportunities to enhance, improve or streamline conservation training to feed the technical assistance pipeline should be pursued. Yet it was also suggested that any such opportunities should not jeopardize the existing conservation training

and certification process for conservation planning, which involves a strong partnership involving NRCS, DEP, State Conservation Commission, conservation districts and Extension. This process insures a high level professionalism and rigor in training conservation technicians. Another important point is that, in order to take advantage of NRCS funding, NRCS conservation plans are a prerequisite. Accordingly, NRCS certified conservation planners must write conservation plans for any farmers who seek NRCS funds to implement practices. While streamlining the training process should be explored, "we shouldn't lessen the process to streamline the process," noted one participant. "Let's strengthen the process instead of replacing it."

Another opportunity exists to train the conservation professionals of tomorrow. Conservation training should also be built into youth education and college and technical school curriculums. Penn State College of Agricultural Sciences in particular has faculty and Extension expertise to provide coursework and mentoring for students interested in becoming technical service providers.

One model that has been developed allows students to work with experienced faculty advisors to attend courses and workshops toward becoming certified nutrient management planners or certified crop advisors. Similar career pathways, certificates or minors could be created for conservation planning, thus making graduating students more attractive to potential employers. Associate degree or certificate programs at other institutions of higher learning, including community colleges and technical schools, could also be pursued.

The third prong for accelerating conservation is reserved for those farmers who are not addressing resource concerns on their operations. Participants expressed support across stakeholder groups for a compliance strategy involving enforcement.

Much discussion was had on what will make a compliance strategy most effective in achieving conservation goals. Several of the work sessions discussed two critical aspects. First, it should be selective in who is targeted. Second, it should be meaningful in that enforcement actions are carried through when necessary.

Many participants were supportive of a compliance strategy that targeted "bad actors." In some instances this includes support from fellow farmers. "The ones who are doing the right thing, they want you to go after a bad actor," said one participant. Selective enforcement directed to bad actors may not only resolve water quality problems on the offending farm, but could have a great deterrent effect leading more farmers to correct their own problems. An effective strategy should "pick out the worst one and make an example of them," suggested one participant. Noted another, "fence row talk spreads quickly."

Another important aspect of an effective compliance strategy, several participants noted, is actual follow through when the threat of enforcement is made. One participant shared that failure to follow through creates frustration for farmers in the community who are in compliance and practicing good conservation and creates complacency among bad actors who do not believe threats are credible. In addition, momentum and "buzz" is created when enforcement efforts are taken, but it can quickly be lost if there is no follow through. Participants noted some regional differences across the Commonwealth in the degree of enforcement.

Discussion also centered on innovative compliance strategies that may not take the traditional inspection and enforcement route. Ideas shared by participants include using local farmer leaders to communicate compliance messages, encourage youth participation in farmer meetings, requiring conservation and nutrient management plans to receive local government approvals such as building permits, building the value of conservation into market prices for farm products, and strategic use and/or withholding of funding to incentivize compliance.

In working with farmers, the value and need for all three of these elements—education/outreach, technical assistance, and enforcement—was recognized by many participants. There was acknowledgment that many conservation professionals work in the realm where lines blur between these elements, and there was acceptance of that reality. Yet some participants expressed that the approach will work best if clear roles are defined and maintained, based on respective expertise and existing relationships.

Extension and farmer-led initiatives and organizations—such as the Pennsylvania No Till Alliance—are natural choices to lead education and outreach efforts. Conservation districts, NRCS and private sector consultants have the training and experience to provide technical assistance. Regulatory agencies would be the logical lead for compliance and enforcement initiatives. DEP, Fish and Boat Commission and EPA (particularly in a "backup role" to DEP) were mentioned by several participants as the agencies with regulatory powers.

Some participants expressed concern that trust would be hindered between farmers and conservation districts if districts begin to take on a compliance role. This trust is critical to working with farmers and influencing them to modify behavior and management strategies to achieve water quality goals over both the short and long term. Others pointed out that this viewpoint is not reflective of past practices of conservation districts in the Commonwealth, which have engaged in multiple outreach, technical assistance and regulatory roles for over three decades.

Revisit and Retool Conservation Incentive Programs

Several existing programs work well and should continue to serve as the core of conservation incentive programs. A willingness exists however to revisit existing programs to improve delivery, and explore innovative new incentive structures.

Participants widely acknowledged that a good conservation incentives program structure exists in the Commonwealth to fund conservation, which has contributed to progress achieved to date. These programs include: USDA programs such as the Environmental Quality Incentives Program (EQIP), the Agricultural Conservation Easement Program (ACEP) the Conservation Stewardship Program (CSP), and the Conservation Reserve and Conservation Reserve Enhancement Programs (CRP and CREP); state programs such as Growing Greener and the Resource Enhancement and Protection (REAP) program; and EPA funding through Section 319 grants and the Chesapeake Bay Stewardship Fund administered by the National Fish and Wildlife Foundation (NFWF).

Conference participants explored opportunities to revisit many of these programs to improve delivery of conservation incentives. In particular, programs to fund forest riparian buffers (primarily CREP) were discussed by many groups. The water quality and multifunctional benefits of buffers and their high cost efficiencies were noted by many and make buffers a very high priority practice. Yet participants also acknowledged that it is hard to incentivize producers to establish forest buffers when they are seeking to maximize production value from their acreage. “A lot of effort is going in to something that is a tough sell,” noted one participant.

The need to develop a more streamlined, flexible riparian buffer program was identified. This includes streamlining paperwork associated with programs to make them easier for producers and providing flexibilities in the standards for buffer establishment and management, including minimum widths and allowable uses within buffer zones. “Buffer bonus,” an innovative buffer incentives approach offered in certain areas by the Chesapeake Bay Foundation and Stroud Water Research Center, was mentioned by several as being successful and worth scaling up. Producers willing to install forest buffers earn a per-acre bonus payment which they can then apply toward their own cost share toward implementation of other conservation practices on the farm.

In addition, participants identified existing challenges and shortcomings in delivering buffer technical and administrative assistance—including outreach and maintenance assistance—with respect to forest riparian buffer programs. Where these shortcomings coincide with areas of high priority areas for buffer restoration, this becomes a critical problem. Increasing delivery staff in these regions and enhancing collaboration of partners was suggested.

Additional improvements to existing programs were discussed. For example, the REAP tax credit program, widely recognized as a success, might attract more producers if property tax credits were offered. Using REAP to incentivize management that benefits soil and water health—that is, creating performance based incentives rather than practice based—was also offered.

Adding baseline conservation requirements to the Clean and Green property tax relief program was also suggested. A bill introduced last session in the General Assembly, HB 1447, would do just that by requiring compliance with agricultural erosion and sediment control plans and manure management plans in order to receive tax relief. Concepts for implementing this requirement were discussed, including: linkage to the agricultural certification program discussed or development of a third party certification program; a conservation district role to help producers keep their Clean and Green eligibility; and a DEP compliance focus on producers not certified as eligible. Some producers at the conference indicated that they would be willing to pay for certification in order to ensure continued tax relief.

Participants also discussed whether more strategic incentive payment program policies could be developed to influence action by non-compliers. Much discussion was had about whether public resources should be used to develop conservation plans for farmers who have been legally required to have them for three decades, with views on both sides of the issue. One interesting idea which emerged was offering funding for planning for a limited time, but then withholding funding and perhaps even issuing fines for farmers who have not gotten their plans after a date certain.

With respect to existing conservation programs in general, many participants expressed that there are just too many programs and too much paperwork associated with these programs. On the other hand, some participants pointed out that it must be acknowledged that these are for the most part government programs, and compliance with federal and state laws and regulations will necessarily carry some level of paperwork requirements. NRCS works hard to spend its funding effectively by targeting conservation program funding and utilizing a local workgroup process to identify local resource concerns.

Yet despite best efforts, some participants expressed that it is difficult for producers and even conservation professionals to navigate the alphabet soup and the administrative terrain to even begin to determine what program is the right fit. Moreover, this contributes to money being spent ineffectively. “We can’t solve the problem by just throwing money at it,” said one participant. “What is being spent now is not being spent effectively.” To this end, suggestions were made to develop a print and web based clearinghouse for incentives program information.

Another suggestion was to streamline the process for obtaining multiple state and federal funding opportunities into more of a local “block grant” process whereby partners in local leadership—such as county conservation districts or a coalition of local organizations—would receive dollars for implementation, determine priorities, and more effectively spend resources to implement conservation on the ground.

Participants also felt that new incentive programs should also be considered and developed. Many participants were supportive of developing a certification and recognition program to recognize and reward those producers are doing an outstanding job protecting water quality. Rewards could take the form of signage, payments and/or certainty from inspections or new regulations, provided the conservation bar was set high enough and the regulatory relief granted was not from existing requirements.

Another concept suggested is working with the food industry and consumers to develop consumer driven, market based incentives for food produced by farms practicing good conservation for clean water. “We have the ‘PA Preferred’ label,” said one participant. “This should be part of what consumers ‘prefer.’ Perhaps food produced by Pennsylvania farms meeting the conservation standard becomes ‘PA Premium’.” These types of programs may also be attractive to large corporations involved in food and agriculture as part of their corporate sustainability programs and supply chain management.

In addition to adding conservation requirements to the Clean and Green program, bringing agricultural lenders and insurers into the conversation was also discussed. This could build upon a 2014 Farm Bill requirement for conservation compliance in order to participate in federal crop insurance programs. Having such entities require conservation and nutrient management plans and meeting all regulatory requirements as prerequisite to necessary financial services could be a powerful incentive to bring non-compliant farmers into compliance.

Other new incentives programs suggested by participants include: reverse auctions (winning bids are those achieving environmental performance based outcomes at lowest cost); debt forgiveness (debt on USDA loans is discharged in exchange for implementing conservation); and a cover crop payment program. Because of barriers to acceptance of government funding which exists within the Plain Sect, development of a special

incentives program for that community involving private entities and not government funding was also offered.

Opportunities for innovation by partnering outside the agricultural community were also discussed. Many participants supported developing partnerships with municipalities with permitted municipal separate storm sewer systems (MS4) faced with meeting nutrient and sediment reductions. Some noted that no-till and cover cropping systems provide high levels of stormwater infiltration. Allowing MS4 municipalities to receive credit for funding agricultural practices could allow them to meet required reductions more cost effectively and would connect urban and agricultural communities in positive, collaborative approaches.

Public-private partnerships to fund larger scale, regional restoration projects involving stream and floodplain restoration through remediation of legacy sediments were also mentioned as worthy of pursuing. These projects can produce multiple, "stacked benefits," including not only nutrient and sediment reductions but flood management, ecosystem restoration and habitat improvement.

Collaboratively Seek New Funding Opportunities

While being more strategic in spending existing resources is critical, existing funding is insufficient to achieve our water quality goals. New funding opportunities must be sought. A unified, collaboratively developed funding strategy offers the best chance for success.

Conference attendees identified several potential new funding sources to meet clean water goals in agriculture.

One of these was a water use fee whereby large consumptive water users already regulated would pay a surcharge to generate dedicated funds for technical assistance staff and conservation practices. Last session, HB 2114 was introduced by Representative Mike Sturla, a member of the Chesapeake Bay Commission, which would charge a .001 cent per gallon fee on non-agricultural, non-municipal water usage over 10,000 gallons a day. It is estimated this would generate $250 million annually for clean water improvement.

In considering new funding sources, developing a truly dedicated fund for agricultural technical assistance and conservation practice implementation was a priority for participants. "We need to make sure the lock box is truly locked and not diverted to other projects," said one.

Many participants supported exploration of private funding—both foundations and corporations. With respect to foundations, some noted that while the western and eastern parts of the state have large foundations that contribute to environmental causes, the Susquehanna basin has a dearth of such private funding sources. Continued efforts to build relationships with the Chesapeake Bay Funders Network and Maryland-based foundations were suggested.

Participants mentioned various corporate and industry funding opportunities. These included the oil and gas industry (it was noted that the Upper Susquehanna region has had some success in tapping into these sources), power companies, particularly through power plant relicensing, and agricultural based industries such as fertilizer or seed companies.

Both private and municipal drinking water suppliers were also mentioned as funding partners, particularly where investment in ag conservation can be tied to source water protection. While government agencies such as EPA, USDA and DEP are traditionally considered in funding water quality improvements in agriculture, the US Department of Interior is an often overlooked source of funding, noted one participant. Government action to leverage private dollars for conservation was also suggested; for example, using penalty dollars from environmental violations to fund restoration projects.

Development of a traditional public fundraising campaign was also discussed, whereby the public contributes directly to a cause they care about. If multiple partners worked together to develop and run such a campaign strategically, it could achieve success, said participants. “People want to fix problems,” noted one participant. “They don’t trust the government to do it for them.” A classic fundraising campaign—whereby individuals are asked to make small contributions, at the grocery store, restaurants, businesses, online—could generate significant funds for conservation. Linking consumer preferences to “clean water produced food” could be part of such efforts, it was noted.

With respect to all of these fundraising efforts, there was strong support for the formation of a diverse and inclusive coalition to develop and campaign for a collaborative new water quality funding strategy. The composition of this coalition may be different than environmental funding coalitions have traditionally been and could include not only nonprofit conservation organizations, conservation districts and resource agencies, but many interests in agriculture, including producers, industry groups, and the food production sector, along with universities, water suppliers, and urban and rural communities.

Such a coalition would have broad, bipartisan appeal. It would need to work collaboratively, in complement to, or as part of existing coalitions in place for similar funding efforts, such as the Growing Greener Coalition which over the last several years has sought support for passage of a Growing Greener III program, which could greatly benefit agricultural water quality efforts.

Participants also recognized traditional competitive grant programs as often counter-productive, pitting many small organizations with commons goals and objectives against each other for limited pieces of the funding pie. It was noted that if a large coalition could be developed with a joint vision for how to collaboratively and effectively utilize large amounts of funding, this might be an attractive and ultimately more successful way of seeking, obtaining and utilizing new funding than the traditional grant driven approach. A thoughtful approach to this would be useful, bearing in mind that the allocation of limited public funds does require a mechanism for equitable distribution.

This strategy could downscale itself to a regional approach, whereby regional coalitions are cultivated, developed and funded in priority areas and which can employ local leadership, flexibility and efficiency in spending dollars to achieve positive conservation

outcomes. The Upper Susquehanna Coalition was mentioned as a successful example of this approach, where nineteen soil and water conservation districts (sixteen in New York, three in Pennsylvania), work together to pool resources, share expertise and collaboratively achieve greater conservation implementation across the region.

INITIATIVES

During the final session of the conference attendees discussed recommendations for moving forward, identifying short and long term action items, additional stakeholders to approach, and organizational frameworks for advancing conference outcomes.

Since the conference, the AEC has facilitated additional feedback to advance conference outcomes. The conference planning committee was reconvened in April 2016 to develop an action plan for moving forward recommendations identified at the conference, and to decide upon a framework to continue to successfully advance the ideas of conference participants.

In April and May 2016, key state and federal agencies, including DEP, PDA, EPA, USDA, and the White House Council on Environmental Quality were debriefed in a series of meetings, at which conference outcomes were presented and ideas for priority initiatives were discussed. In July and August 2016, further feedback was gathered from planning committee members, conference attendees and other stakeholders.

In August 2016 at Ag Progress Days, Pennsylvania Secretary of Agriculture Russell Redding and Penn State College of Agricultural Sciences Dean Richard Roush convened a forum to discuss water quality initiatives in agriculture and the *Pennsylvania in the Balance* Conference. Following this forum, the AEC led three public listening sessions to gather additional input.

On October 12, 2016, the College of Agricultural Sciences hosted *Pennsylvania in the Balance: The Reconvening*. This one day workshop, attended by approximately 100 which included both original attendees of the March conference and new stakeholders, allowed further input into actions moving forward. A draft of this report was shared for comment, and participants worked in facilitated groups to identify priority initiatives and begin to develop action steps for moving these initiatives forward.

Based on ideas shared at the conference and subsequent discussions with key leaders and stakeholders in agriculture and conservation in Pennsylvania, and in particular the work of participants during the October workshop, four initiatives have been identified as top priorities for implementation and action.

Initiative 1. Increase Technical Capacity through Enhancements in Conservation Training Opportunities.

Given that having a plan provides the framework and is the prerequisite to conservation practice implementation, a general consensus developed around pursing this initiative first. There was also recognition that, as training enhancements are pursued, they must

be developed in concert with and must complement existing USDA NRCS and state training programs.

This initiative is premised on the need to build the technical network of conservation professionals necessary to meet current and anticipated increasing farmer demand for developing and implementing conservation plans and manure management plans and their associated conservation practices. To this end, assessment of need, demand and current capacity for technical assistance is an essential first step. Demand is critical to drive technical assistance training needs.

Additional examination of the current capacity for training opportunities is also needed, as well as identification of gaps and overlap. Partners will then explore development of training offerings to fill gaps and streamline training to ensure enough qualified technicians to meet farmer demand. Training curriculum for professionals as well as students within existing course offerings and degree and/or certificate programs will be pursued, as will farmer-to-farmer approaches and community, technical and vo-ag schooling opportunities.

Initiative 2. Develop and Disseminate a Narrative Around a "Culture of Stewardship" through Soil and Stream Health.

The exciting new consensus based, collaborative strategy that has emerged from the conference embraces agriculture and its ingrained *culture of stewardship*, which constitutes the overarching theme infusing the entire partnership's work moving forward. We are looking to agriculture for leadership and to be the solution for clean water. By promoting this new narrative of stewardship and solution oriented leadership, we will move all farmers from looking at conservation as something they *have to* do to something they *want to* do. This narrative will be developed and communicated using traditional and modern, multimedia communication tools and approaches.

The hallmark of this narrative will be a farmer led effort to promote the importance of soil and stream health and making healthy soil and water marketable and fundamental to all agricultural operations across the Commonwealth. The key audience will be producers, in an effort to influence on the ground change by farmers.

While this statewide education and outreach initiative will seek to involve producers, service providers, conservation technicians, Extension educators, nonprofit conservation organizations, and the ag industry, its key methodology will involve farmer leaders as messengers, providing the blueprint for others to follow. It will build off of Pennsylvania's successful farmer-led and agency efforts which embrace peer-to-peer and mentoring approaches, including the Pennsylvania No-Till Alliance and the NRCS soil health initiative. Capacity will be built for farmers to lead this effort. The effort will promote water quality-based conservation practices in the broader context of maintaining soil health and economic profitability.

A holistic approach to on-farm conservation will be taken, integrating soil health with manure management and riparian ecosystem stewardship. This education and outreach

strategy will work with farmers to comply with state regulatory requirements in a way that is good for long-term profitability of the farm, water quality and stream health, thus accelerating conservation implementation. This initiative will embrace the first of three-pronged approach to accelerating conservation implementation—education and outreach—and provide cheap and effective ways of delivering technical assistance through farmer-to-farmer sharing of improved management strategies.

To make this initiative successful and increase its impacts, a strategic communications plan will be developed, with focus on succinct and simple messaging, use of a variety of communications tools, and leveraging partners to market the brand and message.

Initiative 3. Develop New and Creative Incentives to Encourage a High Bar of Conservation Beyond Compliance.

An agricultural certification program will be developed to recognize and reward producers who have reached a high bar of conservation. Recognition based, certainty based and market based incentives will all be explored to encourage producers to pursue certification.

As a first step, agreed upon certification standards for meeting a high bar of conservation must be developed. Consensus exists that these should be standards of excellence which exceed baseline compliance, but further discussion is needed to determine whether standards should be practice based, performance based, or some combination of both.

One category of incentives to encourage farmer participation in the certification program is recognition or reward based. Recognition based incentives acknowledge that farmers appreciate being rewarded for reaching high conservation standards within the industry. Recognition can also motivate peers to raise their conservation bar. Signage, public recognition and financial awards will all be considered.

The linking of certification to a Pennsylvania ag certainty program will also be explored, though there is clear recognition that the certainty bar needs to be well above existing regulatory requirements and that those existing requirements cannot be relaxed. This is particularly true in Pennsylvania where strong regulatory programs addressing agriculture and water quality are already in place. While further discussion is needed, relief from the current program of compliance inspections may be considered sufficient certainty to incentivize farmers to voluntarily accelerate implementation of agricultural conservation practices which take the farmer beyond compliance and bring the Commonwealth closer to meeting local and Bay water quality goals.

Finally, great potential exists for the certification program to be linked to product branding and “clean water” supply chains to meet corporate sustainability goals. The agricultural and food industry will be engaged to discuss consideration of these certifications in food supply chain management, marketing products, and corporate sustainability practices, providing market drivers for conservation practices on farms. Agricultural lenders and insurers will also be brought into the conversation to discuss incorporating conservation into program eligibility.

Initiative 4. Develop and Deploy Delivery Mechanisms for Accelerating Conservation in Priority Watersheds.

The importance of focusing efforts on priority watersheds was emphasized throughout the conference. Criteria for prioritization of watersheds discussed included those where nutrient loads are high, local impairments exist, and local efforts are underway. Conservation efforts will be focused in high priority, high opportunity watersheds, and the delivery mechanisms for achieving collaborative success in those watersheds will be built. These mechanisms include technical assistance in developing watershed plans which identify the right practices to be implemented in the right places, investment in partnership development and partnership management infrastructure, and the cultivation of and support for local leadership.

Where success stories exist in Pennsylvania, they are almost always locally led. This initiative seeks to transform local success stories from the pilot nature they are now to the standard operating procedure for achieving water quality goals in the Commonwealth. Partners who have worked successfully at watershed/regional scales will be brought together to share lessons learned, identify barriers and recommendations for overcoming them, and develop a collective toolbox to help those working on the ground in watersheds.

Priority watersheds identified will be focus areas for building a peer-to-peer collaborative support structure for watershed based efforts. Existing training initiatives and programs (such as the Pennsylvania Rural-Urban Leadership Program (RULE)) may be leveraged to develop a watershed leadership academy to train and build a network of local watershed leaders able to sustain long-lasting watershed partnerships in priority watersheds.

This initiative embraces the three-pronged approach to accelerating conservation implementation by creating local partnerships that first deploy the necessary education, outreach, and technical assistance to implement practices, and only turn to enforcement where non-compliers are given the opportunity but do not respond to these local partnership strategies. It enhances and accelerates the implementation of conservation where it is needed the most, and deploys a smart strategy of delivering a variety of leveraged program dollars to implement priority practices in priority places in an efficient, cost effective manner.

FRAMEWORK FOR IMPLEMENTATION: THE PA IN BALANCE PARTNERSHIP

At the conference wrap up and in subsequent discussions with conference attendees and other key stakeholders, the organizational framework for advancing conference outcomes was discussed. The challenge of balancing a need for structure with a desire to stimulate creativity and flexibility within the framework chosen was raised as a concern.

To meet this challenge, the resulting recommendations from the conference and from post-conference discussions are to develop an implementation framework consisting of an informal, collaborative partnership facilitated by the AEC. A **PA in Balance Partnership Council**, consisting of the conference planning committee and other willing participants including critical producer representation, is proposed to serve as the steering committee for this partnership moving forward (see Appendix E).

This framework will oversee the implementation of the four priority initiatives previously discussed above. Each of these initiatives will be led by individuals and organizations in Pennsylvania with expertise and commitment to advance plans to action.

Opportunities to share progress and receive continued input from the larger set of stakeholders participating in the conference will be pursued by devoting a page on the AEC website to PA in Balance, and by offering additional conferences or workshops as needed in the future.

CONCLUSION

The energy, ideas and collaborative spirit that came out of the *Pennsylvania in the Balance Conference* truly has the potential to fundamentally change the conversation and the course of action regarding agriculture's role in solving our Commonwealth's most pressing water quality problem. The initiatives put forward in this document have the potential to universally change the mindset from *I have to do it* to *I want to do it*. In the months following the conference we have seen already the Partnership and its members making strides to advance conference outcomes and capitalize on conference ideas and themes.

In conclusion, it is worth noting that conference attendees have made a conscious decision to name this exciting new partnership the "PA *in Balance* Partnership." The *Pennsylvania in the Balance Conference* was timely held, as the future of Pennsylvania's agriculture and its rivers and streams hangs *in the balance* at this particular moment in time. But we believe the conference in March 2016 has played its part in changing the course for the better. We are hopeful that we may be able to achieve the inspiring vision of Pennsylvania agriculture *in balance*, if all partners continue to work collaboratively toward implementation of initiatives to meet our common goals of viable, vibrant agriculture and healthy rivers and streams.

For more information on the *Pennsylvania in the Balance Conference*, and the PA in Balance Partnership, contact Matt Royer, Director, Penn State Agriculture and Environment Center, mroyer@psu.edu, (814) 863-8756.

This publication is available in alternative media on request.

APPENDICES

APPENDIX
A

REFERENCES

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APPENDIX
B

AG IN BALANCE WHITE PAPER (2008)

Agriculture in Balance: A Vision for Pennsylvania (2008)

Agriculture in Balance *is profitable, productive, progressive, and proactive, preserving its rich heritage of community involvement and environmental stewardship to build a better Pennsylvania. It provides an abundant and diverse supply of safe food, fiber, fodder, and renewable fuel where farmsteads, towns, and cities are nestled within a healthy mosaic of fields, forests, pastures, woodlands, and flowing waters. Agriculture in Balance is engaged in every level of society from the local community to the nation's capital, providing equitable opportunities for livelihood and enrichment.*

Unpacking the Vision

On November 16, 2007, The Pennsylvania State University hosted a workshop to create a vision, a word picture, of what Agriculture in Balance means for Pennsylvania. Workshop participants included elected local, county, and state officials; farmers; representatives from local, state, and federal agencies; farm organizations; academia; and nonprofit organizations. The information provided by the workshop participants was used to craft the vision stated above. There was considerable discussion as to the meaning and intent of various phrases and words in this vision. As with any vision statement, each of the words is packed with information. This white paper unpacks the vision statement so interested individuals and organizations can better understand what the vision for Agriculture in Balance in Pennsylvania means. In unpacking the vision, various phrases will be highlighted, followed by a synopsis of the discussion that occurred among workshop participants as to their understanding and intent of the words and phrases.

Agriculture in balance—A recent article in *Penn State Agriculture* discussed agriculture in Pennsylvania as being out of balance because of soil erosion; excess nitrogen and phosphorus runoff into streams and, eventually, the Chesapeake Bay; contribution of manure applications to groundwater pollution; and putting marginal land into production (view the article at www.aginfo.psu.edu/psa/07SumFall/outofbalance.html). A future with Agriculture in Balance has resolved these issues by reducing soil erosion to natural background levels, putting nutrients into agricultural commodities rather than streams and bays, and making productive alternatives with agricultural residues, with marginal land contributing to greater societal uses.

Profitable and productive—Agriculture in Balance is both profitable and productive. Agriculture is a business. Peter Drucker said the purpose of business is to create and satisfy needs in society and to give back to the community. Being profitable means the products have value and society's needs are met. Value-added products are an integral part of production. Increased efficiency, improved management practices, better use of existing markets, and new goods and services all contribute to greater productivity.

Progressive and proactive—Agriculture in Balance has an entrepreneurial mindset, continually acting on and creating new markets and products in response to consumer needs and societal trends. Agriculture is proactive in becoming both energy independent and an energy supplier for the region through wind, solar power, biogas, renewable fuels, and other energy sources. It provides testing grounds for concepts ranging from pollutant trading to carbon credits, to integrated best management practices, and the development of new and emerging markets.

Preserving its rich heritage of community involvement—From barn raisings, food depots, service, fairs, and 4-H youth development, farmers and agricultural organizations have always been involved in community activities. Agriculture in Balance supports research, education, and civil society organizations in their mission to improve the quality of life in the local and global communities.

Environmental stewardship—While ecosystem goods and services represent a new framework for environmental assessment, this concept is historical in agriculture. Soil formation, closed nutrient cycling, erosion control, diverse and balanced fish and wildlife populations, and water infiltration are all part of good agricultural practices and environmental stewardship. Ecosystem services are protected, sustained, and restored to nurture the production of agricultural goods. Agriculture in Balance provides ecosystem services upstream that contribute to increased social, environmental, and economic capital downstream throughout Pennsylvania.

To build a better Pennsylvania—Agriculture is an integral part of the social, economic, and environmental fabric of Pennsylvania, contributing to an improved quality of life throughout the Commonwealth and surrounding region. Agriculture in Balance provides the natural and cultural amenities people enjoy in living and visiting rural areas—fields of clover and soybeans, verdant hillsides, clean streams, abundant birds and wildlife, and peaceful glens. Agriculture makes a $45 billion economic contribution to building a better Pennsylvania.

An abundant and diverse supply—Abundance and diversity exist not only in types of agricultural products—from organically grown vegetables to hybrid corn, heritage horses

to livestock, fruits and nuts to milk chocolate—but also in size and types of producers. Farms range in size from family-owned orchards and gardens that supply local markets to large corporate farms providing grain, meat, milk, and eggs to global markets.

Safe food, fiber, fodder, and renewable fuel—Regardless of the produce, all agricultural foodstuffs from fruits and vegetables to animal feed and products—are safe to eat and handle. Humane husbandry practices are used in both raising and processing animals. But agriculture is more than just food. It is also a source of fiber, building materials, and renewable energy, from switchgrass, grain, and timber to methane from manure and other agricultural byproducts.

Farmsteads, towns, and cities are nestled within a healthy mosaic of fields, forests, pastures, woodlands, and flowing waters—Humans are part of, not apart from, terrestrial and aquatic ecosystems. The landscape consists of towns and cities nestled within a mosaic of fields, pastures, and forests that sustain its healthy streams. Wildlife habitat and resting areas for migrating neotropical birds are part of this rich and diverse mosaic. Various best management practices enhance agricultural, terrestrial, and aquatic ecosystems.

Engaged in every level of society from the local community to the nation's capital—Agriculture in Balance raises leaders who care for the health and welfare of their communities and states and want to be part of the democratic process of governance. These individuals contribute to informed legislation and policy on issues ranging from agricultural practices and economics to smart growth in the local community, county, and state. These leaders also contribute to informed national legislation and policy on free market incentives that support diverse agricultural opportunities in Pennsylvania and the global marketplace.

Equitable opportunities for livelihood and enrichment—Agriculture in Pennsylvania is known for its rich diversity of ethnicity, gender, and age. Agricultural vocation and employment is open to anyone. Individual lives are enriched because their unique talents and abilities can be used and recognized, and these individuals can see the difference their efforts make in improving the environmental, social, and economic welfare of Pennsylvania. Agriculture in Balance raises leaders by positively touching every facet of their lives.

Vision Participants—Creation and Review

Bill Angstadt,
Maryland/Delaware Agribusiness Association

Doug Beegle,
The Pennsylvania State University

Rob Brooks,
The Pennsylvania State University

Karl Brown,
State Conservation Commission

Dave Day,
Pennsylvania Fish and Boat Commission

Craig Derickson,
Natural Resources Conservation Service

Matt Ehrhart,
Chesapeake Bay Foundation

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Brian Hill,
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Mary Wirth,
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George Wolffe,
Wolffe Consultants

APPENDIX

C

Pennsylvania in the Balance

CONFERENCE AGENDA

Tuesday, March 1, 2016

12:00 – 1:30 PM **Registration/Check-in**

Participants can check in at the registration table outside the General Session room from 12:00–1:30 p.m. and from 6:00-8:00 p.m. For anyone arriving after 8, the registration table will be set up outside the general session room. Participants can check in any time. Please stop at the registration table for assistance.

1:30 – 1:50 PM **Welcome and Introductions**

Dean Richard Roush, College of Agricultural Sciences
Matt Royer, Penn State Agriculture and Environment Center

1:50 – 2:50 PM **Setting the Stage: Progress to Date and Our Collective Challenge**

The water quality improvement requirements of the Clean Water Act and the Chesapeake Bay TMDL are reviewed so we understand our "collective challenge." In the face of this challenge, much has been accomplished in the agricultural sector toward meeting water quality goals. These successes demonstrate that progress is possible in addressing Pennsylvania's water quality issues.

Steve Taglang, PA Dept. of Envt'l Protection
Karl Brown, PA Dept. of Agriculture
Denise Coleman, NRCS
Bill Wehry, USDA FSA

2:50 – 3:05 PM **Networking Break**

3:05 – 3:45 PM **PA Agriculture and Water Quality: Current Trends**

Current pictures of Pennsylvania agriculture and water quality will be presented by experts looking at the latest agricultural data from USDA National Agricultural Statistics Service and nutrient and sediment load trends from the Chesapeake Bay nontidal monitoring network.

King Whetstone, USDA NASS Northeast Regional Director
Scott Phillips, USGS

3:45 – 4:15 PM **PA Water Quality Now and Tomorrow: Miles to Go**

While progress has been made, both state water quality goals and Chesapeake Bay commitments are not being met. In particular, Pennsylvania progress in meeting Bay milestones has fallen short. Recognizing this, the Commonwealth has recently announced a new strategy for achieving water quality and Chesapeake Bay restoration goals.

Lee McDonnell, PADEP
Matt Ehrhart, Stroud Water Research Center

4:15 – 5:15 PM **Framing the Issue: Hard Facts (Matt Royer, Moderator)**

A panel of diverse stakeholders share their thoughts on the challenges faced in meeting water quality goals and sustaining a vibrant agriculture in Pennsylvania.

Pete Kleinman, USDA ARS
Karl Brown, State Conservation Commission
Denise Coleman, USDA NRCS
Chris Herr, PennAg Industries
John Bell, PA Farm Bureau
Harry Campbell, Chesapeake Bay Foundation
Jim Shortle, Penn State Environment and Natural Resources Institute

5:15 – 5:30 PM **Summary of the Discussion, Preview of March 2nd (Lara Fowler, Facilitator)**

6:00 – 7:30 PM **Welcome Reception (Heavy hor d'ouerves)**

Join us for a welcome reception and meet the diverse range of individuals and agencies that hold a stake in seeking solutions to Pennsylvania agriculture's environmental challenges – from scientists and regulators to authority managers, farmers, and environmentalists.

7:30 PM **Short check in discussion with Steering Committee**

Wednesday, March 2, 2016

7:00 – 8:00 AM **Continental Breakfast**
Join us for a continental breakfast before the day's activities.

8:00 – 8:15 AM **What Went Bump in the Night? (Lara Fowler, Facilitator)**
What issues or questions arose during yesterday's discussions?

8:15 – 8:25 AM **The Importance of the Producer Perspective**
Secretary Russell Redding, PA Dept. of Agriculture

8:25 – 9:15 AM **Producer Panel**

Join us for an informative panel with producers to learn more about the industry perspective on agriculture and water quality, and the barriers and opportunities for agriculture in meeting the Commonwealth's clean water goals.

Jim Harbach, Schrack Farms Partnership, Logantown, PA
Raymond King, Lancaster County, PA
Josh Daniels, Just-A-Mere Farm, Dalmatia, PA
Hannah Smith Brubaker, Village Acres, Mifflintown, PA
Jim Hershey, Hershey Farms, Elizabethtown, PA

9:15 – 9:30 AM **Plenary: Setting the Stage for Work Session 1 (Strategies for Targeting) and Work Session 2 (Technical Assistance)**

Plenary Speakers: Pete Kleinman, USDA ARS (Targeting); Peter Hughes, Red Barn (TA)

9:30 – 10:45 AM **Facilitated Work Session 1: Who, What and Where: Strategies for Targeting Resources**

Given finite resources to meet PA's agricultural goals for improving local and Bay water quality, it is important to ask who, what and where should our resources be targeted. In recent years, there has been an increasing understanding of the importance of targeting, with development and utilization of priority watersheds for federal and state funding programs. Further opportunities and strategies for doing this will be discussed and identified.

10:45 – 11:15 AM **Networking Break**

11:15 – 12:30 PM **Facilitated Work Session 2: Ensuring Adequate Technical Assistance Capacity**

Farmers rely on conservation professionals to provide technical assistance to develop conservation and nutrient management plans and to design and implement conservation practices. Yet the work load is great and a TA "bottleneck" exists in Pennsylvania. Participants will discuss and identify strategies for ensuring adequate and timely TA.

12:30 – 1:30 PM **Lunch and Report Out (Full group)**

During lunch, each discussion group will report out on morning discussions.

1:30 – 1:45 PM **Plenary: Setting the Stage for Work Session 3 (Innovations in Incentives) and Work Session 4 (Compliance)**

Plenary Speakers: Bill Angstadt, Angstadt Consulting (Innovations in Incentives); Marel King, Chesapeake Bay Commission (Compliance)

1:45 – 3:00 PM **Facilitated Work Session 3: Innovation in Incentives for Implementation**

Many programs exist to incentivize conservation on the ground. The myriad of programs can, in fact, be overwhelming and a barrier to adoption. Moreover, even with strong financial incentives, some high priority practices, such as forest riparian buffers, are presently not experiencing the adoptions rates needed to meet our water quality goals for agriculture.
Participants will discuss and identify strategies to create an incentives structure that maximizes the acceleration of adoption given finite resources.

3:00 – 3:30 PM **Networking Break**

3:30 – 4:45 PM **Facilitated Work Session 4: Compliance**

Some farmers are not in compliance with existing state laws and regulations regarding agriculture and the environment. Participants will discuss and identify strategies needed to ensure baseline compliance throughout the Commonwealth.

5:45 – 5:30 PM **Report out: Outcomes from Breakout Discussions**

At the close of the facilitated discussions, each group will give a brief summary of their discussions.

5:30 – 5:45 PM **Day 2 Wrap Up**

6:30 – 8:00 PM **Reception**

Please join us for an evening reception, where participants can continue to enjoy good company and thought provoking conversation. Heavy hor d'ouerves will be served.

Thursday, March 3, 2016

7:00 – 8:00 AM **Continental Breakfast**
Join us for a continental breakfast before the day's activities.

8:00 – 8:30 AM **What Went Bump in the Night, Setting the Stage for Day 3 (Lara Fowler, Facilitator)**

8:30 – 8:45 AM **Plenary: Setting the Stage for Work Session 5 (Funding) and Work Session 6 (Who, What & How)**

Plenary Speakers: Harry Campbell, Chesapeake Bay Foundation (Funding); Matt Ehrhart, Stroud Water Research Center (Who, What & How)

8:45 – 10:00 AM **Facilitated Work Session 5: Developing a Funding Strategy to Obtain Additional Resources for Water Quality Improvement**

Existing funding amounts are inadequate to meet local water quality and Chesapeake Bay goals. New sources of funding must be sought. Participants will work to identify a new water quality funding strategy.

10:00 – 10:30 AM **Networking Break**

10:30 – 12:00 PM **Facilitated Work Session 6: Who's On First? The Who, What and How of Getting it Done**

Achieving water quality improvement and ensuring a thriving agricultural industry in Pennsylvania is no easy task. It will take a well-conceived and organized collaborative partnership to accomplishing these dual goals. Participants will map out the structure of this partnership, the roles of partners, and identify the collective process for accelerating our efforts.

12:00 – 12:30 PM **Prioritizing Implementation Strategies and Action Items**

12:30 – 12:45 PM **Closing Comments**

Dean Roush, Penn State College of Ag Sciences
Secretary Russell Redding, PA Dep't of Ag

12:45 – 2:00 PM **Lunch, Wrap Up, and Action Items**

Matthew Royer, Penn State University

During lunch, a summary of the outcome stemming from work accomplished the previous day and a half will be reviewed for further refinement.

APPENDIX
D

List of *Pennsylvania in the Balance*
ATTENDEES
(attending March and/or October meetings)

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American Farmland Trust

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Environmental Protection Agency

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Kerry Golden
House Ag & Rural Affairs Committee

Carl Goshorn
Cumberland County Conservation District

Jim Harbach
Schrack Farms

Matthew Henjum
Chesapeake Legal Alliance

Christian Herr
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Jim Hershey
Hershey Farms

Martie Hetherington
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APPENDIX
E

PA in Balance

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